The future of the LNG spot market

IGU PGCD Study Group D3

better energy for the future

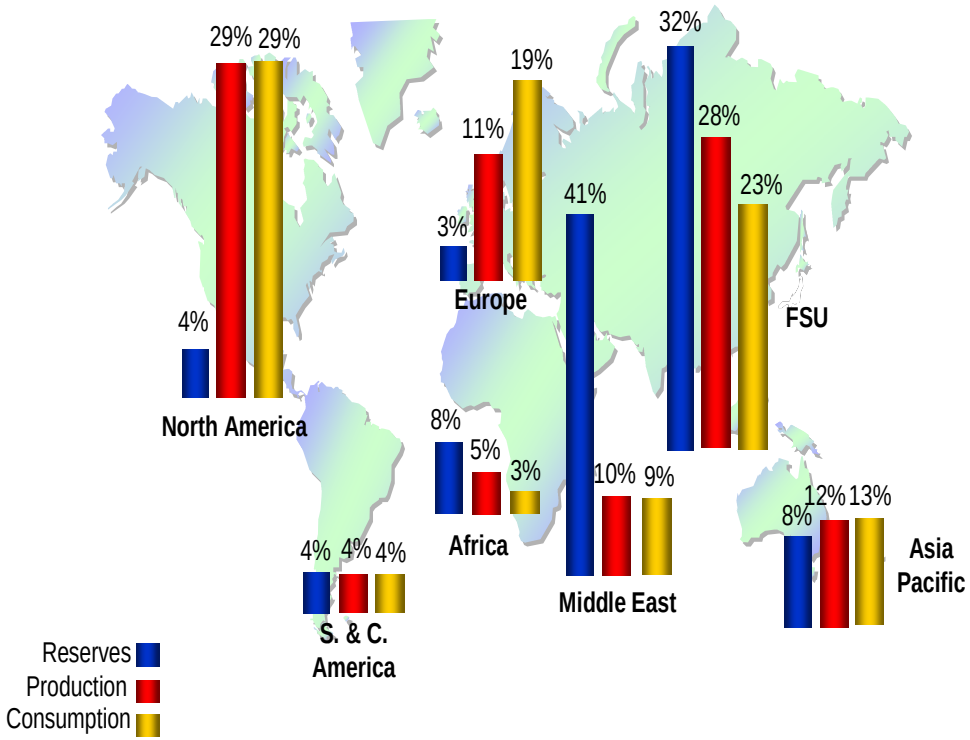
Contents

1. What is the LNG spot?

- Define “spot transactions as all LNG contracts of less than one year”
- Spot trading on LNG market is very different from that of Oil market.
- The reason why PGCD3 has studied during last triennium is that we thought the role of LNG spot is going to be more and more important than LNG market had been expected.

2. Global Statistics on LNG spot trade

Natural Gas in the world : It's perfect for LNG



Proved Reserves of NG : 179.5 10^3 Gm^3 = 169 Gtep (31.12.2004)

Marketed Production of NG : 2691.6 Bcm (2004)

Source : BP Statistical Review 2005

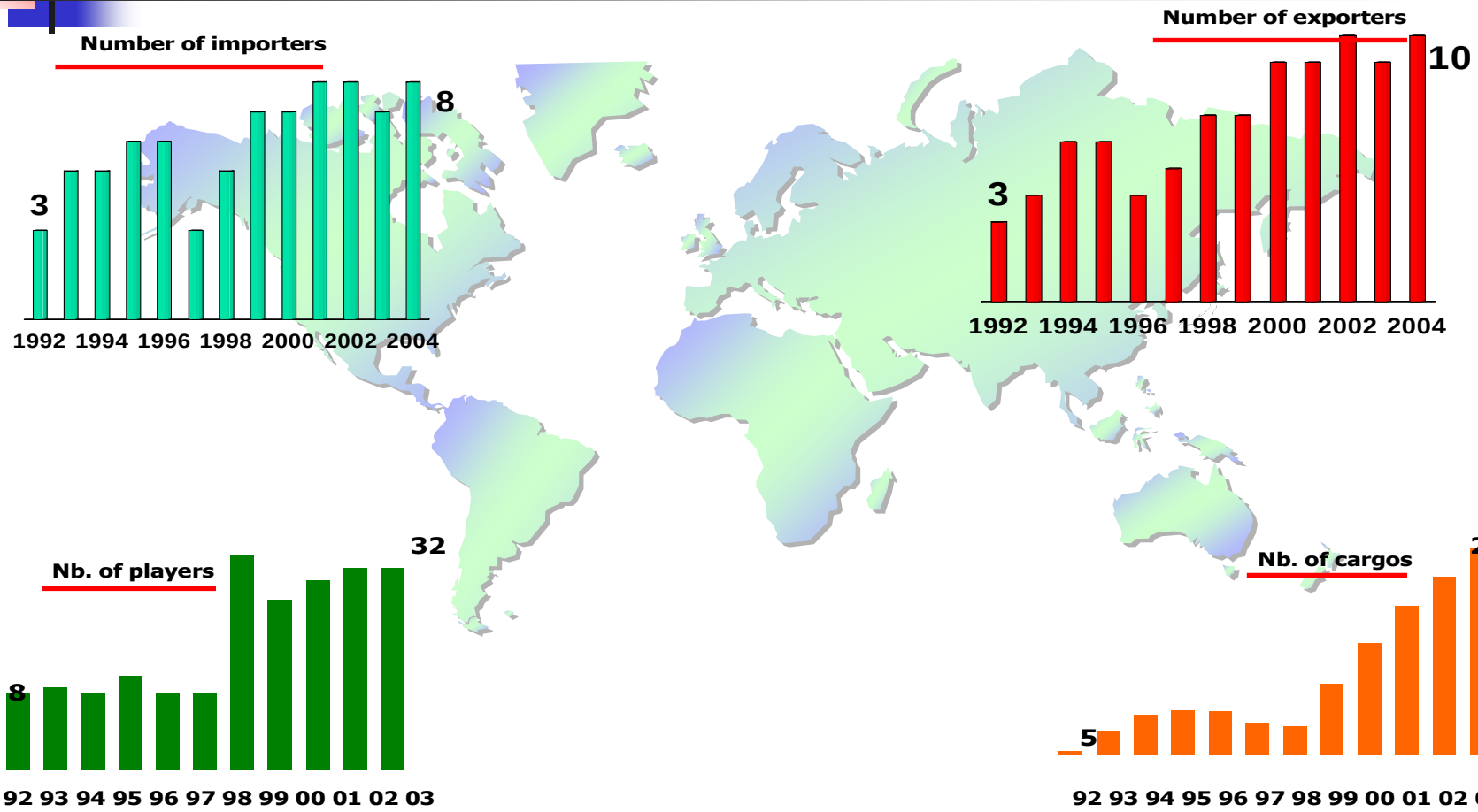
1) NG Consumption : 2,689bcm

2) International NG Trade : 680bcm
(25 % of total consumption)

- Pipeline NG : 502cm
- Liquefied NG : 178bcm

3) LNG Trade : 178bcm
- Japan : 77bcm (1st)
- Republic of Korea : 30bcm(2nd)
- U.S.A. : 19bcm(3rd)
- Others : 52bcm

Spot LNG Trading growth (1992 – 2004)

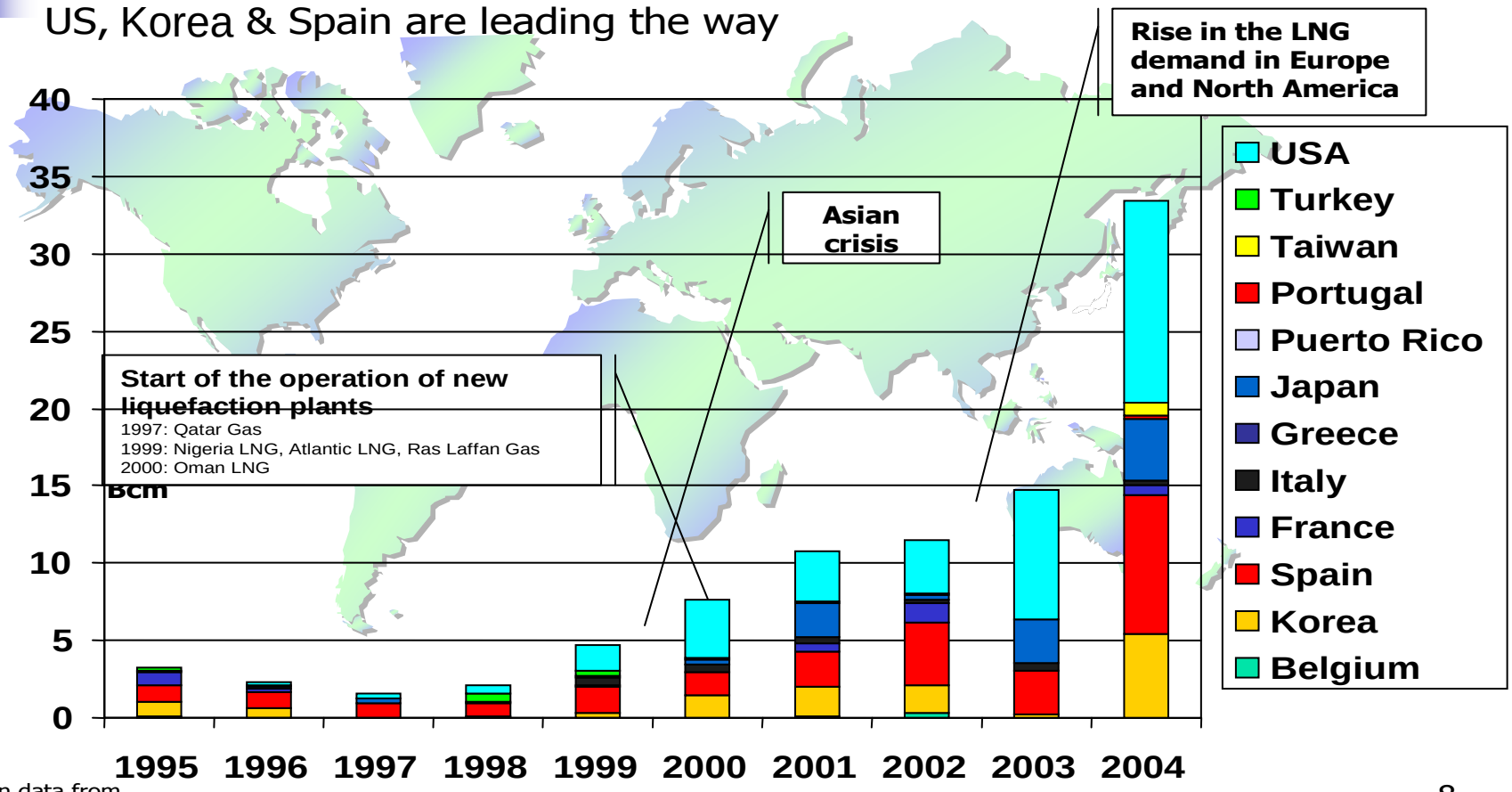


‹Trend of LNG spot trade›

Importers										
Belgium	150	0	0	0	0	0	150	265	0	0
Korea	900	675	0	75	305	1.470	1.870	1.790	225	5.416
Spain	1.050	980	985	825	1.685	1.430	2.290	4.155	2.755	8.977
France	865	225	0	0	75	75	525	1.170	75	601
Italy				115	540	480	375	275	450	400
Greece										
Japan	75	150	280	0	150	320	2.230	315	2.835	3.896
Puerto Rico								50		0
Portugal						75				271
Taiwan							75		75	798
Turkey	225	75	0	575	300	0	0	0	0	0
USA	0	225	300	525	1.660	3.725	3.235	3.420	8.340	13.113
India										
Dominican Republic										
Total	3.265	2.330	1.565	2.115	4.715	7.575	10.750	11.440	14.755	33.472
Share of spot trade	2,0 %	1,3 %	0,8 %	1,1 %	2,2 %	3,2 %	4,3 %	4,4 %	5,0 %	10,7 %

Which LNG Import Countries are active in Spot Trading ?

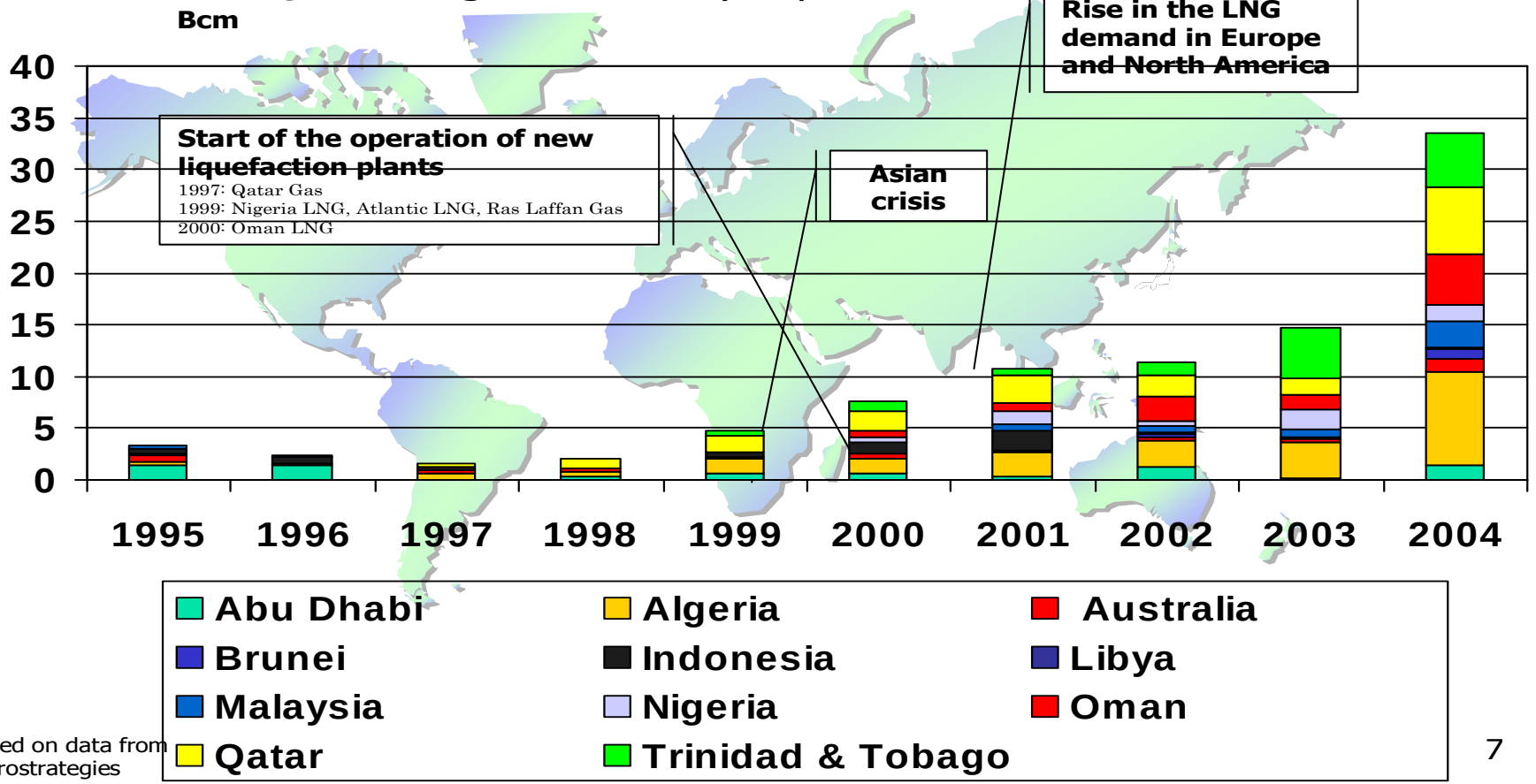
US, Korea & Spain are leading the way



Source : Based on data from Petrostrategies

Which LNG Export Countries are active in Spot Trading ?

Trinidad, Qatar & Algeria were key exporters



Source : Based on data from Petrostrategies

3. Key Drivers & Constraints

- **The main factors driving a continued growth of the LNG spot market**

1) The share of “liquid markets” in the overall LNG market mix increases
2) The need for flexibility increases as a result of liberalization process
3) The margins derived from opportunistic spot transactions increase
4) The acceptability of spot LNG risk for LNG producers (and lenders) increases
5) Midstream and downstream investments will offer room for spot

- **The potential impediments to the spot market development**

1) LNG Quality issues
2) Ship compatibility issues
3) The contractual constrains
4) The traders' creditworthiness
5) The volatility and the need for security

4. Area Report

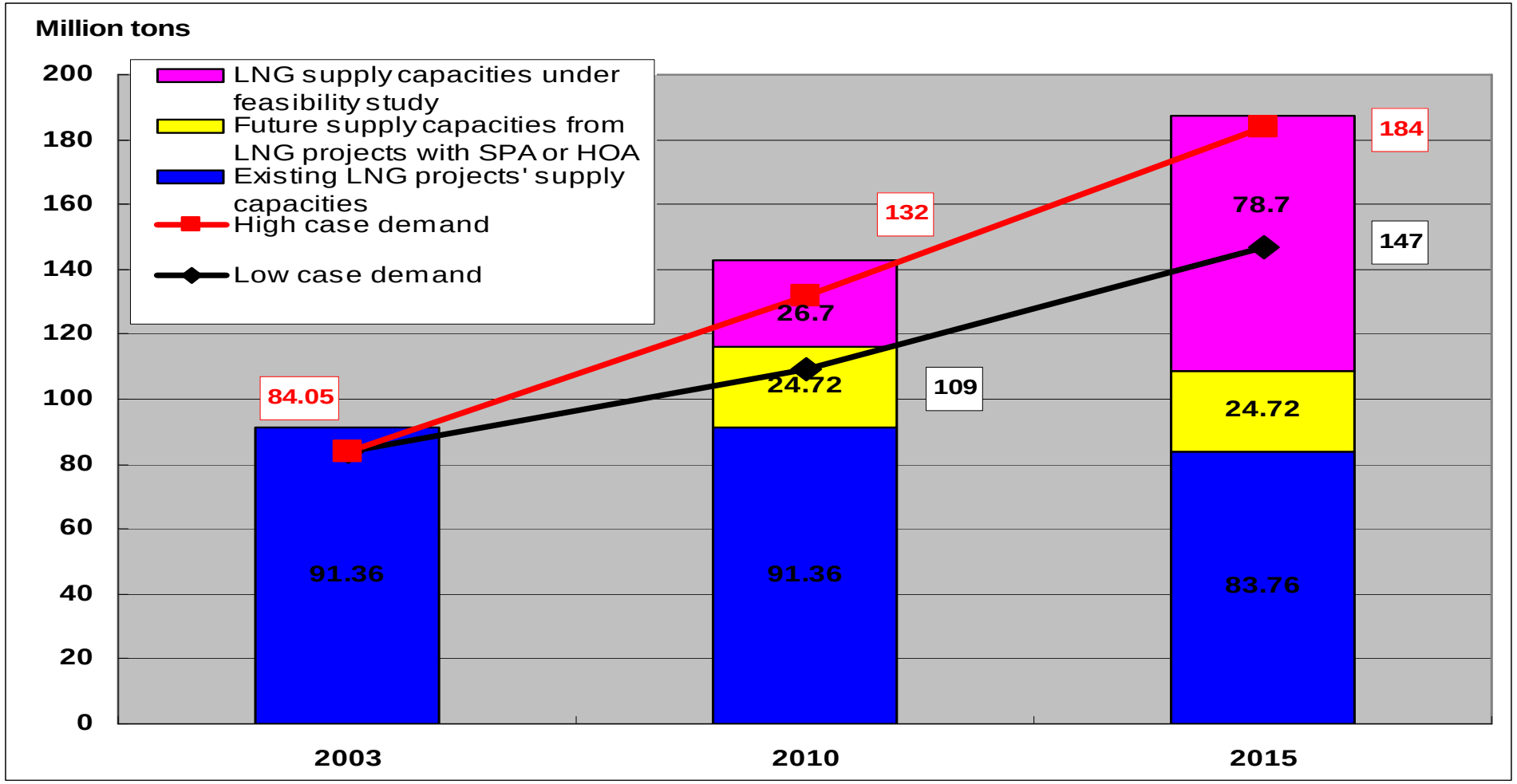
1) Asia

• Market environment

- Asia is the largest LNG importing region. Japan has been a major LNG importer since the first introduction of Alaska LNG to the country in 1969. The import volume in 2004 was 76.95BCM, accounting for 43.2% of the world LNG trade. That of Korea and Taiwan is 29.89BCM(16.8%) and 9.13BCM(5.1%) respectively.
- LNG has been traded mostly under long-term contracts.
- In 2004, India, the latest new emerging LNG importer in this region, started receiving LNG at the Dahej terminal.
- China will be coming next with the Guangdong project whose first phase is slated in 2006.

☞ An increase in the number of LNG importers in this region may create more opportunities for the spot LNG trading and have an impact on traditional LNG trade in Asia.

• LNG Demand/Supply balance in Asia region in 2010 and 2015



4. Area Report

2) Europe

• Market environment

- Traditionally European natural gas demand has been covered mainly by pipeline gas. Decline in North Sea gas reserves, increase in demand and production cost and deregulation of European gas and electricity markets have all combined to create new opportunities for LNG.
- In 2004, LNG represented 16% of natural gas in Europe. It is expected to increase to 25% in 2009.

☞ At present, the European market is undergoing structural changes resulting from the liberalization process that is taking place.

• Liquefaction & Regasification Capacities

	Supply Capacity (Mtpa)	Main destinations
Algeria	17,1	Europe
Egypt	5,5	Europe/USA
Libya	0,6	Spain
Nigeria	9,5	Europe
Oman	0,88	Spain
Qatar	7,65	Europe
Abu Dhabi	0,75	Europe
Trinidad & Tobago	9,9	Europe/USA

	Terminals		Receiving Capacity (Mtpa)
	Existing	Future	
Belgium	1		3,35 - 10,1
France	2	1	11,2 - 24,85
Greece	1		1,5 - 3,36
Italy	2	3	5 - 31,9
Portugal	1		3,88 - 6,34
Spain	4	2	32 - 35,2
Turkey	1	1	4,6 - 9,1
United Kingdom	1	2	3,3 - 32,3

4. Area Report

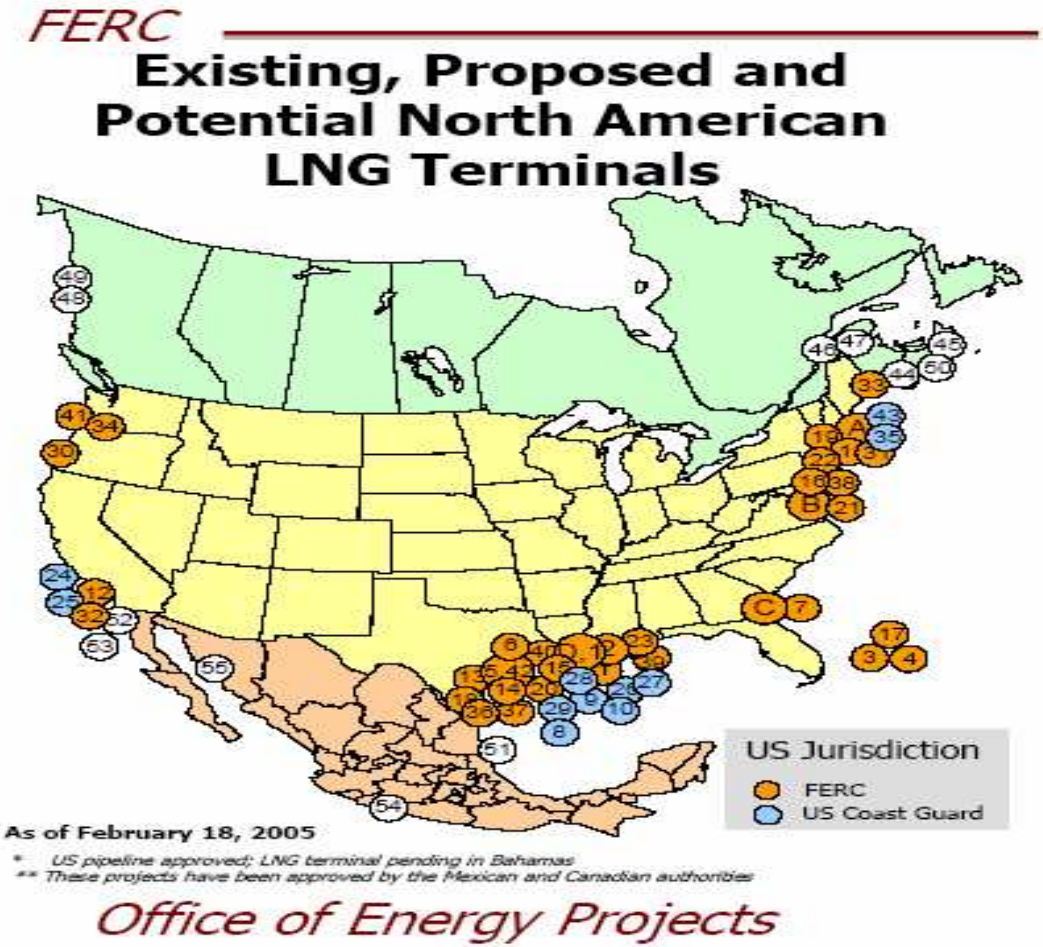
3) USA

• Market environment

- The North American natural gas market today is characterized by strong and growing demand from over 68 million customers, an extensive pipeline grid with numerous options for transportation and trading, and dwindling domestic supplies.
- Natural gas accounts for about one-fourth of the energy use in the U.S. and consumption is forecasted to increase 40% by 2025. About 84% of gas used in the U.S. is produced in the U.S., with 13% coming from Canada and only 3% delivered as LNG, most of which is delivered pursuant to short-term contracts.

☞ Exports from Canada are expected to decline and Alaskan gas remains stranded until a pipeline is constructed. Thus, there is a great deal of excitement about the role that LNG can play in filling the looming supply gap.

• Infrastructure Capacities of the LNG value chain



Constructed
A. Everett, MA : 1.035 Bcfd (Tractebel - DOMAC)
B. Cove Point, MD : 1.0 Bcfd (Dominion - Cove Point LNG)
C. Elba Island, GA : 0.68 Bcfd (El Paso - Southern LNG)
D. Lake Charles, LA : 1.0 Bcfd (Southern Union - Trunkline LNG)

Approved by FERC
1. Lake Charles, LA: 1.1 Bcfd (Southern Union - Trunkline LNG)
2. Hackberry, LA : 1.5 Bcfd, (Sempra Energy)
3. Bahamas : 0.84 Bcfd, (AES Ocean Express)*
4. Bahamas : 0.83 Bcfd, (Calypso Tractebel)*
5. Freeport, TX : 1.5 Bcfd, (Cheniere/Freeport LNG Dev.)
6. Sabine, LA : 2.6 Bcfd (Cheniere LNG)
7. Elba Island, GA: 0.54 Bcfd (El Paso - Southern LNG)

Approved by MARAD/Coast Guard
8. Port Pelican: 1.6 Bcfd, (Chevron Texaco)
9. Gulf of Mexico: 0.5 Bcfd, (El Paso Energy Bridge GOM, LLC)
10. Louisiana Offshore : 1.0 Bcfd (Gulf Landing - Shell)

Proposed to FERC
11. Fall River, MA : 0.8 Bcfd, (Weaver's Cove Energy/Hess LNG)
12. Long Beach, CA : 0.7 Bcfd, (Mitsubishi/ConocoPhillips - Sound Energy Solutions)
13. Corpus Christi, TX : 2.6 Bcfd, (Cheniere LNG)
14. Corpus Christi, TX : 1.0 Bcfd (Vista Del Sol - ExxonMobil)
15. Sabine, TX : 1.0 Bcfd (Golden Pass - ExxonMobil)
16. Logan Township, NJ : 1.2 Bcfd (Crown Landing LNG - BP)
17. Bahamas : 0.5 Bcfd, (Seafarer - El Paso/FPL)
18. Corpus Christi, TX: 1.0 Bcfd (Ingleside Energy - Occidental Energy Ventures)
19. Providence, RI : 0.5 Bcfd (Keyspan & BG LNG)
20. Port Arthur, TX: 1.5 Bcfd (Sempra)
21. Cove Point, MD : 0.8 Bcfd (Dominion)
22. LI Sound, NY: 1.0 Bcfd (Broadwater Energy - TransCanada/Shell)
23. Pascagoula, MS: 1.0 Bcfd (Gulf LNG Energy LLC)

Proposed to MARAD/Coast Guard
24. California Offshore: 1.5 Bcfd (Cabrillo Port - BHP Billiton)
25. So. California Offshore : 0.5 Bcfd, (Crystal Energy)
26. Louisiana Offshore : 1.0 Bcfd (Main Pass McMoRan Exp.)
27. Gulf of Mexico: 1.0 Bcfd (Compass Port - ConocoPhillips)
28. Gulf of Mexico: 2.8 Bcfd (Pearl Crossing - ExxonMobil)
29. Gulf of Mexico: 1.5 Bcfd (Beacon Port Clean Energy Terminal - ConocoPhillips)

Potential Sites Identified by Project Sponsors
30. Coos Bay, OR: 0.13 Bcfd, (Energy Projects Development)
31. Somerset, MA: 0.65 Bcfd (Somerset LNG)
32. California - Offshore: 0.75 Bcfd, (Chevron Texaco)
33. Pleasant Point, ME : 0.5 Bcf/d (Quoddy Bay, LLC)
34. St. Helens, OR: 0.7 Bcfd (Port Westward LNG LLC)
35. Offshore Boston, MA: 0.8 Bcfd (Northeast Gateway - Excelerate Energy)
36. Galveston, TX: 1.2 Bcfd (Pelican Island - BP)
37. Port Lavaca, TX: 1.0 Bcfd (Calhoun LNG - Gulf Coast LNG Partners)
38. Philadelphia, PA: 0.6 Bcfd (Freedom Energy Center - PGW)
39. Pascagoula, MS: 1.3 Bcfd (ChevronTexaco)
40. Cameron, LA: 3.3 Bcfd (Creole Trail LNG - Cheniere LNG)
41. Astoria, OR: 1.0 Bcfd (Skipanon LNG - Calpine)
42. Freeport, TX: 1.5 Bcfd, (Cheniere/Freeport LNG Dev. - Expansion)
43. Offshore Boston, MA: 0.4 Bcfd (Neptune LNG - Tractebel)

Canadian Approved and Potential Terminals
44. St. John, NB : 1.0 Bcfd, (Canaport - Irving Oil)
45. Point Tupper, NS 1.0 Bcf/d (Bear Head LNG - Anadarko)
46. Quebec City, QC : 0.5 Bcfd (Project Rabaska - Enbridge/Gaz Met/Gaz de France)
47. Rivière-du- Loup, QC: 0.5 Bcfd (Cacouna Energy - TransCanada/PetroCanada)
48. Kitimat, BC: 0.61 Bcfd (Galveston LNG)
49. Prince Rupert, BC: 0.30 Bcfd (WestPac Terminals)
50. Goldboro, NS 1.0 Bcfd (Keltic Petrochemicals)

Mexican Approved and Potential Terminals
51. Altamira, Tamulipas : 0.7 Bcfd, (Shell/Total/Mitsui)**
52. Baja California, MX : 1.0 Bcfd, (Sempra & Shell)**
53. Baja California - Offshore : 1.4 Bcfd, (Chevron Texaco)
54. Lázaro Cárdenas, MX : 0.5 Bcfd (Tractebel/Repsol)
55. Puerto Libertad, MX: 1.3 Bcfd (Sonora Pacific LNG)

5. For the future

- The market share of spot trade in LNG accounted for 10.7% in 2004. It showed a very exciting growth rate comparing with 5.0% in 2003. Nevertheless, the 20 -25year long-term contracts still comprises a majority of the LNG market.
- However we can observe that there is a trend for the LNG spot price to be unified with the Henry Hub gas price in the LNG market. Therefore, going forward we need to pay even closer attention to the role of LNG spot trade
- This report should be considered a first step in examining the scope and role of the LNG spot market within the broader markets for LNG and natural gas. It is our hope that additional research and examination on the topic will be forthcoming in the next Triennium.

World LNG Market

Trade movements – LNG*

Billion cubic metres

To	From USA	Trinidad & Tobago	Oman	Qatar	UAE	Algeria	Libya	Nigeria	Australia	Brunei	Indonesia	Malaysia	Total imports
North America													
USA	–	10.71	0.24	0.39	–	1.51	–	1.42	–	–	–	0.08	**14.35**
S. & Cent. America													
Dominican Republic	–	0.30	–	–	–	–	–	–	–	–	–	–	**0.30**
Puerto Rico	–	0.74	–	–	–	–	–	–	–	–	–	–	**0.74**
Europe													
Belgium	–	–	–	–	–	3.15	–	–	–	–	–	–	**3.15**
France	–	–	–	–	–	9.20	–	0.67	–	–	–	–	**9.87**
Greece	–	–	–	–	–	0.55	–	–	–	–	–	–	**0.55**
Italy	–	–	–	–	–	2.02	–	3.50	–	–	–	–	**5.52**
Portugal	–	–	–	–	–	–	–	0.85	–	–	–	–	**0.85**
Spain	–	0.08	0.32	1.87	0.24	7.48	0.75	4.22	0.08	–	–	–	**15.04**
Turkey	–	–	–	–	–	3.86	–	1.13	–	–	–	–	**4.99**
Asia Pacific													
Japan	1.64	0.08	2.16	9.05	6.87	–	–	–	10.27	8.93	24.05	16.72	**79.77**
South Korea	–	–	6.49	7.88	–	0.23	–	–	0.17	0.74	6.93	3.79	**26.23**
Taiwan	–	–	–	–	–	–	–	–	–	–	4.68	2.80	**7.48**
TOTAL EXPORTS	**1.64**	**11.91**	**9.21**	**19.19**	**7.11**	**28.00**	**0.75**	**11.79**	**10.52**	**9.67**	**35.66**	**23.39**	**168.84**

Henry Hub

Oil Product

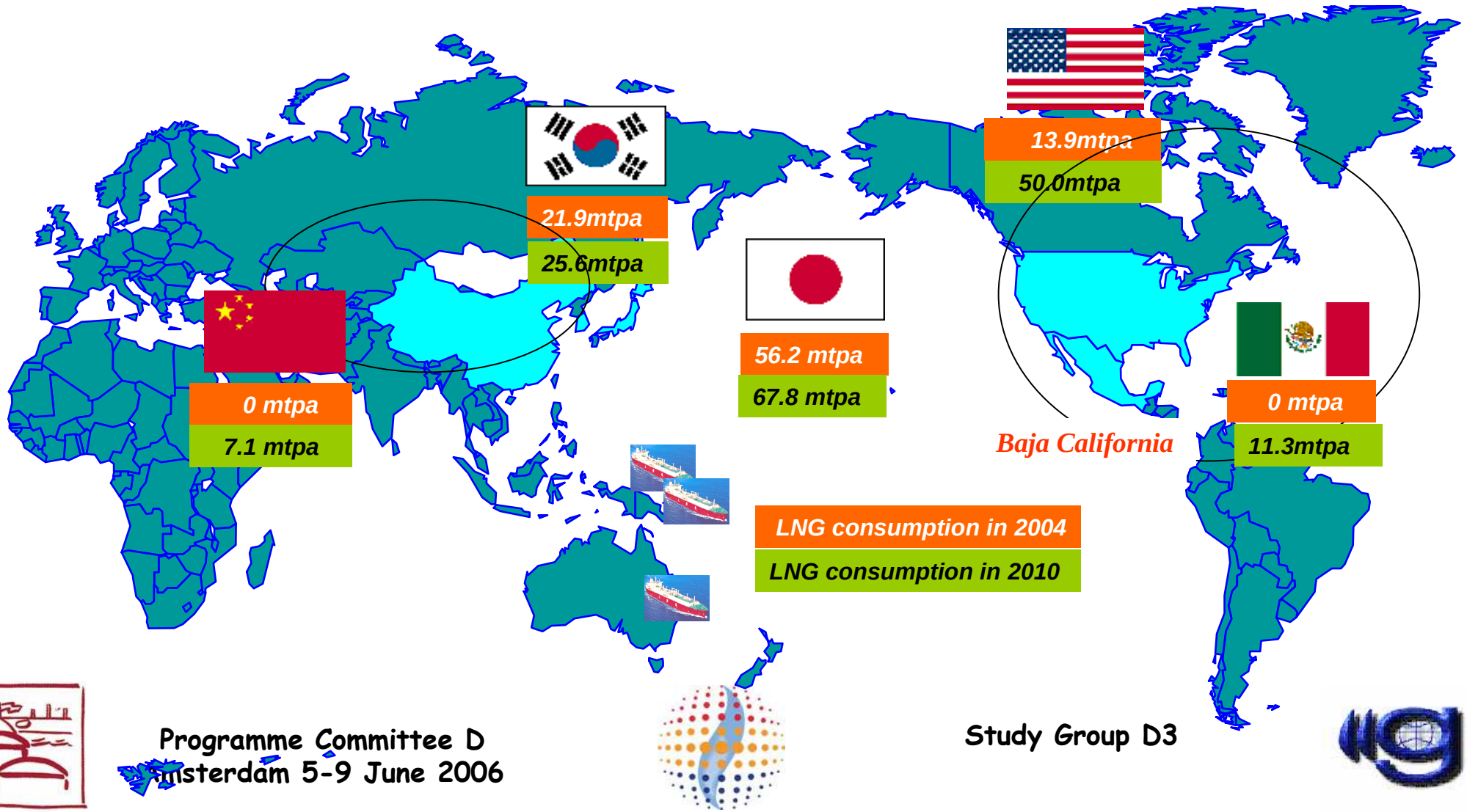
JCC / ICP

*Liquefied natural gas.

Source: Cedigaz (provisional).

Note: Flows are on a contractual basis and may not correspond to physical gas flows in all cases.

Competition to procure the LNG spot



Thank you